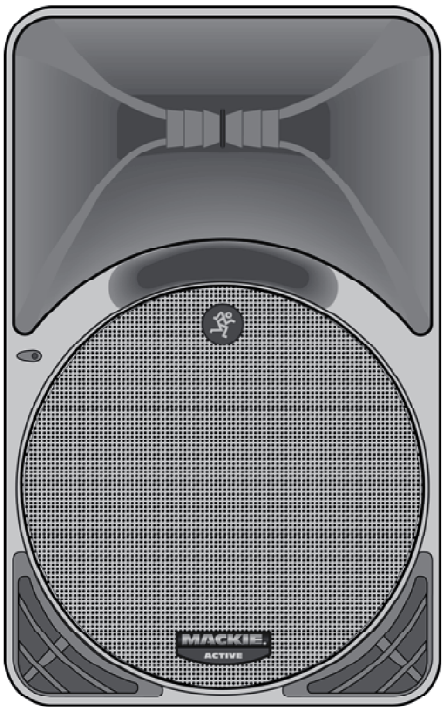
MACKIE®

SRM450

Powered Speaker



SERVICE MANUAL

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820-184-00

MACKIE. SRM450 SERVICE MANUAL

SERVICE ON THIS EQUIPMENT IS TO BE PERFORMED BY
EXPERIENCED REPAIR TECHNICIANS ONLY
CONFIER L'ENTRETIEN AU PERSONNEL QUALIFIE

CAUTION *AVIS*

RISK OF ELECTRIC SHOCK
DO NOT OPEN
RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE THE COVER (OR BACK)
NO USER SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED PERSONNEL

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE

TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION: POUR EVITER LES RISQUES DE CHOC ELECTRIQUE, NE PAS ENLEVER LE COUVERCLE. AUCUN ENTRETIEN DE PIECES INTERIEURES PAR L'USAGER. CONFIER L'ENTRETIEN AU PERSONNEL QUALIFIE.

AVIS:POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, N'EXPOSEZ PAS CET ARTICLE A LA PLUIE OU A L'HUMIDITE.

POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UN PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS LAISSER AUCUNE PARTIE A DECOUVERT.

This apparatus does not exceed the Class A/Class B (whichever is applicable) limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

ATTENTION :Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant las limites applicables aux appareils numériques de class A/de class B (selon le cas) prescrites dans le réglement sur le brouillage radioélectrique édicté par les ministere des communications du Canada.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio energy and, if not installed properly and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Le symbole éclair avec point de flèche à l'intérieur d'un triangle équilatéral est utilisé pour alerter l'utilisateur de la présence à l'intérieur du coffret de "voltage dangereux" non isolé d'ampleur suffisante pour constituer un risque d'éléctrocution.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Le point d'exclamation à l'intérieur d'un triangle équilatéral est employé pour alerter les utilisateurs de la présence d'instructions importantes pour le fonctionnement et l'entretien (service) dans le livret d'instruction accompagnant l'appareil.

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INTRODUCTION

SERVICE ON THIS EQUIPMENT IS TO BE PERFORMED BY
EXPERIENCED REPAIR TECHNICIANS ONLY
CONFIER L'ENTRETIEN AU PERSONNEL QUALIFIE

This manual contains basic service information. It is essential that you have a copy of the user's manual as this contains the complete operating instructions.

SERVICE TECHNICAL ASSISTANCE

Mackie Designs, Service Technical Assistance, is available 8AM - 5PM PST, Monday through Friday for Authorized Mackie Service Centers, at 1 800 258 6883. Feel free to call with any questions and speak with a carefully-calibrated technician. If one is not available, leave a detailed message and a qualified Mackoid will return your call asap.

DISCLAIMER

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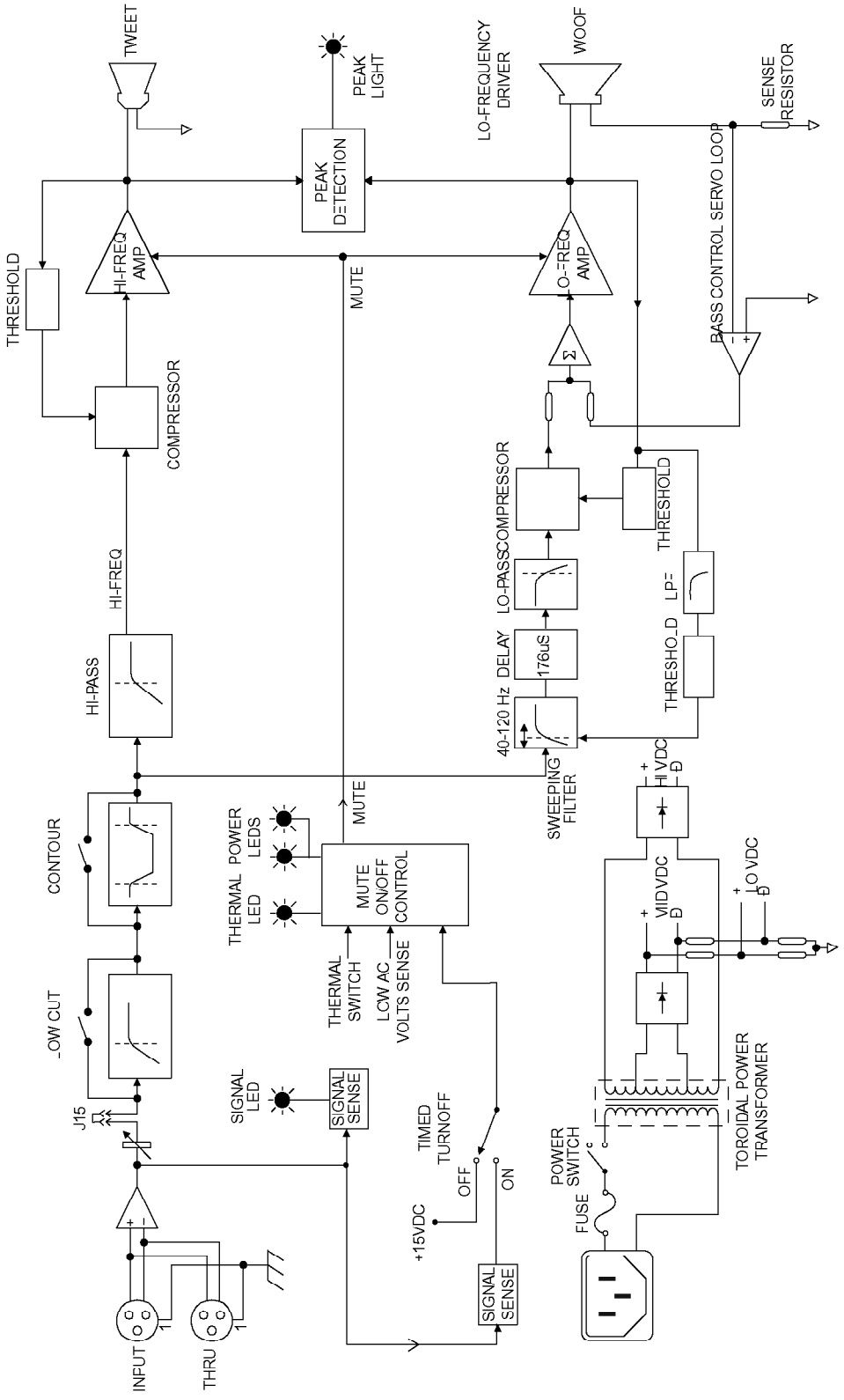
Block Diagram



Specifications

Low-Frequency Transducer

Diameter	300mm (12")
Voice Coil Diameter	63.5mm (2.5")
Sensitivity (1W@1m)	98 dB
Nominal Impedance	8 ohms
Power Handling	300W
Frequency Range	50Hz – 3000Hz

High-Freq Driver and Hom

Diaphragm Diameter	44.5mm (1.75")
Exit Throat Diameter	24.5mm (1")
Diaphragm Material	Titanium
Sensitivity (1W@1m)	106 dB
Nominal Impedance	8 ohms
Power Handling	150W
Frequency Range	1000Hz – 20,000Hz

Low-Freq Power Amplifier

Rated Power	300 watts
Rated THD	< 0.1%
Cooling:	Convection Extrusion
Design:	Class G, Parametric Servo Feedback

High-Freq Power Amplifier

Rated Power	100 watts
Rated THD	< 0.1%
Cooling:	Convection Extrusion
Design:	Conventional Class AB

System specs

Input Type	Balanced Differential
Input Impedance	Line: 20k ohms
Input Protection	RFI and level protected
Sensitivity	Line: +4 dBu (centered) Mic: –36 dBu
Maximum Input Level	Line: +22 dBu
Low-Cut Frequency	75Hz, Second-order filter
EQ	Peaking +3 dB @ 55Hz, +3 dB @ 20kHz
Over Excursion Protection	Second-Order High-Pass Filter
Thermal Protection	Amplifier shutdown, auto-reset

Low-Line Voltage Shut Down: 60% Nominal line

Acoustic Freq Response:	45Hz – 20,000Hz
Low-Freq –3 dB Point:	55Hz
Maximum SPL @ 1m:	123 dB
Low-Freq Crossover:	24 dB/octave, time offset corrected
High-Freq Crossover:	24 dB/octave
Crossover Frequency:	1600Hz
Driver Protection	Independent LF and HF compressors
Low-Freq Roll-Off:	Dynamic-signal level dependent
Accessory Interface	±15V DC
Operating Temp Range	–10ºC - 45ºC (14ºF - 113ºF)

Line Input Power

US	120V, 60Hz
Europe	230V, 50Hz
Japan	100V, 50/60Hz

Disclaimer

Since we are always striving to make our products better by incorporating new and improved materials, components, and manufacturing methods, we reserve the right to change these specifications at any time without notice.

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Overview

The SRM450 is an active two-way loudspeaker system capable of extremely high sound pressure levels.

The Transducers

The SRM450 active monitors feature a 12" high-power low-frequency woofer and a 1.75" titanium diaphragm high-output precision compression driver. This high frequency driver is mounted on an acoustically non-resonant exponential waveguide, providing a wide, controlled dispersion and precise reproduction of the critical upper mid-range and high frequencies. The result is an unbelievably smooth off-axis response that allows everyone in the audience to experience the same high-resolution audio no matter where they are seated.
Each driver has been specifically designed by our engineers for optimum performance in the lightweight high-strength cabinet.

FR Series Power Amplifiers

To power these beautiful things, each SRM450 includes two of our acclaimed FR Series "Fast Recovery" power amplifiers. Our exclusive design uses low negative feedback, yet allows the amplifiers to maintain low distortion and stability and to quickly recover when driven into clipping.

The amplifiers include the following features:

- The low-frequency amplifier produces up to 540 watts peak (300 continuous) before clipping.
- The high-frequency amplifier produces up to 150 watts peak (100 continuous) before clipping.
- Each amplifier has its own compressor circuit that acts when the input signal is large enough to cause clipping, distortion and excessive voice coil heat. The compressor will automatically decrease the input signal to a safe level. The compressor in the low-frequency amp works independently from that in the high-frequency amp.
- The low-frequency amp uses a servo feedback loop which senses the current flowing in the woofer coil. This controls the low-frequency response and maintains low distortion at high output levels.
- The low-frequency amplifier also has a sweeping filter. This will automatically move the low cut-off frequency up or down depending on the amplifier output. For example, if the amplifier is below clipping, the low-frequency cut-off point is 55l lz. As it approaches clipping, this shifts up smoothly to 120Hz, providing more power reserves and less distortion before clipping. This happens quickly and continuously, protecting the amplifer and the woofer and reducing any noticable distortion.

  Warning: Although the amplifiers have these protection circuits, you must still make sure the PEAK light is not blinking often or continuously. If it is, turn down your mixer faders, or preamplifier gain, or turn down the SRM450 LEVEL control.

The Crossover

The built-in electronic crossover is a 24 dB/octave Linkwitz-Riley design. Although more expensive than other crossover designs, the benefits provided by the Linkwitz-Riley design have been well documented. These benefits include:

- Absolutely flat frequency response throughout the bandpass, without the characteristic ripple near the crossover point exhibited by other designs.
- The sharp 24 dB per octave roll-off of the filters ensures that the transducers aren't reproducing frequencies outside of their capabilities.
- The acoustic sum of the two driver responses is unity at the crossover frequency, resulting in perfect power response.
- Our heroic engineers have worked carefully to ensure that the SRM450 also provides perfect phase response. This diligence has yielded phenomenal accuracy, even if you are standing 20 feet away.

The Cabinet

The SRM450 cabinet was designed to be the strongest molded composite cabinet on the planet. This material is as strong as concrete, and rigid enough to prevent unwanted vibrations in the cabinet. It has built-in fly points for hanging, and a socket in the bottom for mounting on a tripod stand. Although it is an exceptional choice for installed sound situations, its light weight and durable finish also make it ideal for portable sound system use. The asymmetrical trapezoidal design of the cabinet makes it easy to use as a floor wedge for stage monitor applications.

Safety test

You must perform the following leakage test before returning the unit to your customer. Take every safety precaution to protect yourself while doing this test.

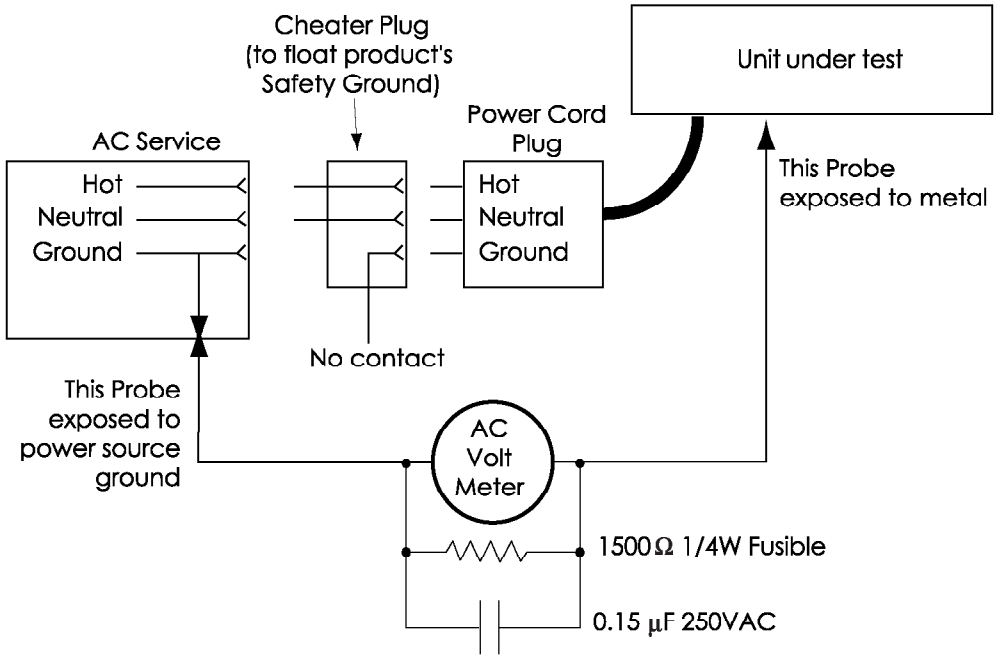
1. Make a small loading RC circuit as shown in the diagram below, and connect the AC volt meter between the AC power source ground and any exposed metal on the unit under test.

2. Connect the unit under test to an AC power source using a ground-lift adaptor, leaving the unit's safety ground floating. Turn the unit on.

3. The meter reading should be less than 750mVAC (note: this is equivalent to 0.5mA of leakage current).

4. Flip the plug over in the receptical so the hot and neutral are swapped. Verify that the reading is still less then 750mVAC.

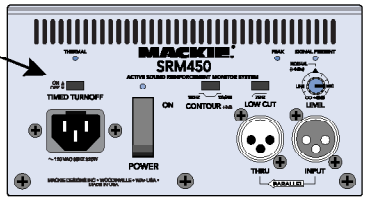
5. If either reading is greater than 750mVAC, then you must investigate and repair the unit before returning it to your customer.



Bias adjustment

The Amplifier Bias of every SRM450 must be carefully adjusted as follows.

1. Place the SRM450 on its side so that the heatsink fins are horizontal.
2. Connect the power cord and turn it on, with no input signal applied. Make sure that the TIMED TURNOFF switch is OFF.

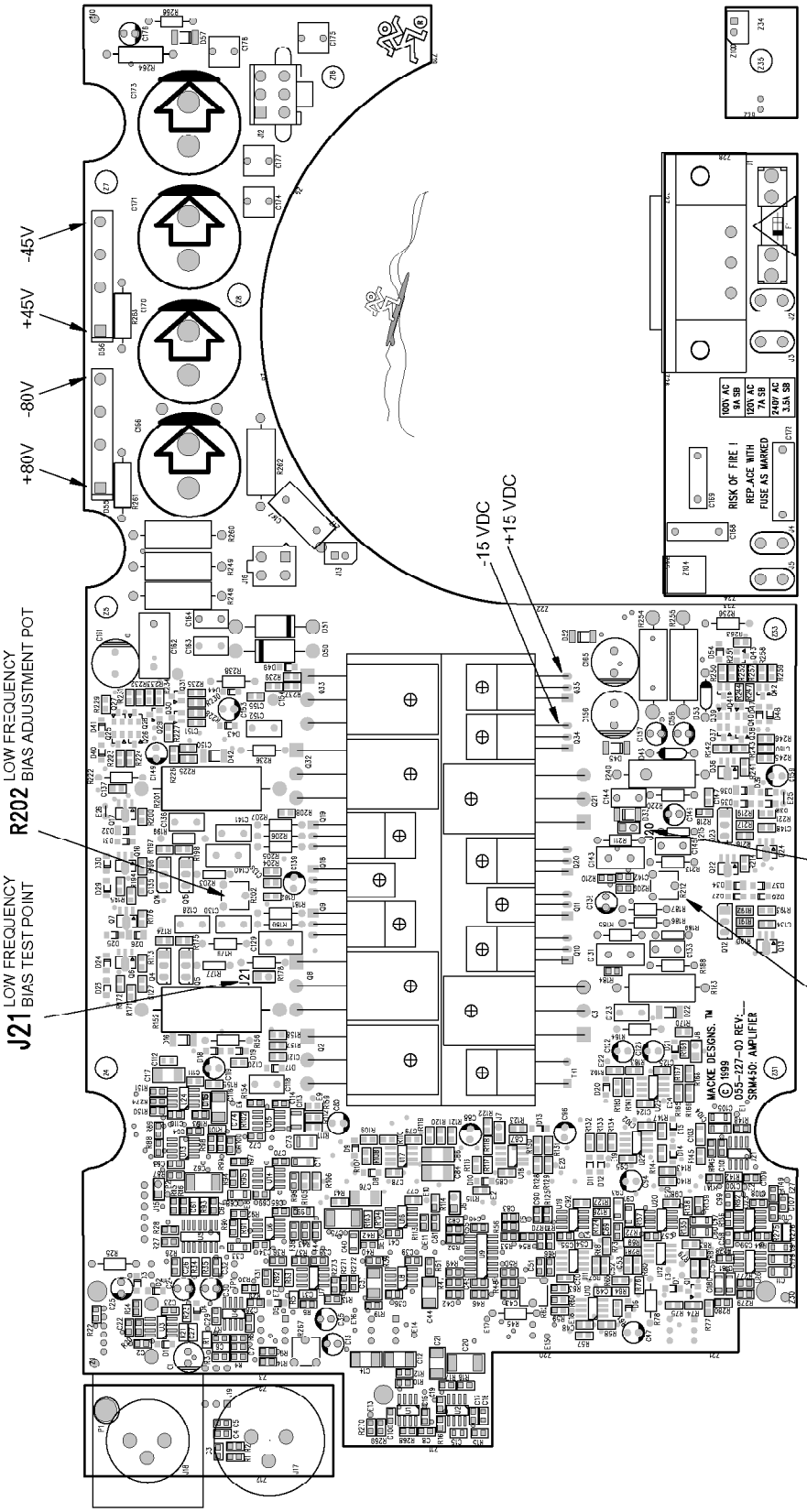


3. Let it sit this way for an hour or more to allow the heatsink temperature to rise. You can play music through to speed things up. If you have a thermometer, the bias adjustment procedure is best done when the heatsink temperature is 45 to 50 deg C.
4. Turn off the SRM450 and remove the power cord.
5. Remove the complete amplifier/heatsink assembly from the plastic speaker case but leave all wires connected, including the speaker wires. Support the amplifier so it can be safely turned on again.
6. Replace the power cord and turn on the amplifier and **take care** not to touch any exposed live AC components.
7. No input signal is applied.
8. Low frequency amplifier bias adjustment:

   While the heatsink is still warm, measure the DC voltage across the 2 pins of J21. Adjust R202 until a reading of 4mV to 4.5mV is reached. See sheet 2 for the location of J21 and R202.

   Important: When finished adjusting, secure R202 with a small drop of paint, such as nail varnish.
9. High frequency amplifier bias adjustment:

   Measure the DC voltage across the 2 pins of J20. Adjust R212 until a reading of 4mV to 4.5mV is reached.
   Important: Secure R212 with a small drop of paint.
10. This completes the adjustment procedure. Reassemble and perform a full test.


-45V
+45V
-80V
+80V
-15 VDC
+15 VDC
R202 LOW FREQUENCY BIAS ADJUSTMENT POT
J21 LOW FREQUENCY BIAS TEST POINT
J20 HIGH FREQUENCY BIAS TEST POINT
R212 HIGH FREQUENCY BIAS ADJUSTMENT POT
RISK OF FIRE ! REP.ACE WITH FUSE AS MARKED
100V AC 9A SB
120V AC 7A SB
240V AC 3.5A SB
MACKIE DESIGNS, TM
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053-227-01 REV:
SRM450 AMPLIFIER

SRM-450 PARTS LIST

Parts Numbering guide

040- Cables
055- Finished PCB Assy
100- Pots and resistors
200- Capacitors
300- Semiconductors
400- Jacks/Connectors
500- Switches
510- Fuses
550- Chassis Metalwork
600- Transformers
601- Inductors
610- Wires and Cables
640- AC line cords
700- Hardware
760- Knobs/Plastic
770- Fans
790 Misc./Packing
800- Printed Material
860- EPROM

PART#	DESCRIPTION	PAGES
090-132-xx	Master Parts	A-2
080-136-00	Cabinet subassembly	A-3
055-227-00	Main Board	A-4

Components noted with this symbol shall be replaced only by the component specified. This is required to maintain product safety.

Master Parts List 090-132-xx

PART NO.	DESCRIPTION	REV	QTY	NOTES
090-132-00	SRM450 120V	9 A3	1	
080-112-00	SA HTSK/XFMR/BD 12IN SPKR	B1 A2	1	
080-112-01	SA AMP SRM450 230V	A2 A2	1	
055-227-00-02	PCB ASSY SRM450 AMPLIFIER	2C A2	1	See Page A-4
080-137-00	SA SW SRM450	B	1	
080-138-00	SA XFMR 600-034-00	B A1	1	For 120V units
080-138-01	SA XFMR 600-034-01	A A1	1	For 230V units
080-138-02	SA XFMR 600-034-02	A A1	1	For 100V units
510-013-00	FUSE SB 7A 5X20MM 250V	A	1	For 120V units
510-011-00	FUSE SB 4A 5X20 250V IEC	B	1	For 230V units
510-024-00	FUSE SB 8A 5X20MM 250V	A	1	For 100V units
550-398-00	SCRN BACK PNL MAIN SRM450	A	1	
550-460-00	SHLD M6 PC SRM450	A	1	
550-488-00	SHLD .015 M6X 4 3/4 ID	1 A1	1	
551-071-00	PNT EXTR HTSK SRM450	A	1	
700-010-01	TF 6-32X3/8 PHP BLKZC	A	9	
700-010-06	TF 6-32X1/2 PHP BLKZC	A	4	
700-011-00	MCH 4-40X1/4 BTNSKT BLKOX	A	3	
700-028-00	SEMS 6-32X1/4 PHP BLKZC	B	8	
700-034-02	SEMS 4-40X3/8 PHP BLKZC	A	4	
700-113-00	BOLT CAR 5/16-18 2IN STL	A	1	
701-016-00	5-20X5/16 PHPII TYP B BLK	A	4	
705-001-00	KEPNUT 6-32	A	2	
705-005-00	NUT LOCK 4-40	A	4	
705-018-00	NUT HEX 5/16-18 (GD-5)	A	1	
710-005-00	WASHER INT STAR NO.6 BLK	A	4	
710-017-00	WASH SPLTLCK 5/16 HEAVY	A	1	
710-024-00	WASH FLAT 5/16 HARD (USS)	A	1	
720-007-00	TAPE DS 30MIL X 1.0W URTH	A	AR (as required)	
730-001-00	THERMAL JOINT COMPOUND	A	AR	
730-025-00	LOCTITE 222	A	AR	
740-001-00	TYRAP 3-1/4L	A	1	
740-003-00	TYRAP 8IN BLK	A	3	
760-018-00	KNOB 11MM DARK GRAY	B	1	
780-052-00	INSULATOR PCB SRM450	A	1	
780-111-00	WASH RUB (W/TRANSFORMER)	A	1	
080-136-00	SA SRM450 CABINET	A	1	See next page (A-3)
092-903-00	LC IEC SJT 1250W 10A/125V	A	1	
640-002-02	LC JAPAN 12A 125VAC 8FT	C	1	Linecord for 100V units
550-397-00	PLATE COVER SRM450	A	1	
701-021-00	6X3/8 PHP PLASTITE BLK	A	4	
730-035-00	ACTIVATOR NO.2287 NORTON	A	AR	
760-115-00	SIDE HANDLE GRIP SRM450	A	2	
760 116 00	PLASTIC SIDE HANDLE	A	2	
800-139-00	SLEEVE SRM450	A	1	
820-158-00	OWN MNL SRM450	A	1	

Components noted with this symbol shall be replaced only by the component specified. This is required to maintain product safety.

Cabinet Subassembly 080-136-00

PART NO.	DESCRIPTION	REV	QTY	NOTES
055-280-00	PCB ASSY LED		1	
080-156-00	SA CABLE PCB LED BLK/WHT		1	
080-157-00	SA SUPPORT DRIVER THROAT		1	
080-158-00	SA HARNESS BLU & BLU/BLK		1	
080-159-00	WIRE YEL WOOFER		1	
490-025-00	COMP DRIVER		1	Comp driver
490-042-00	WOOFER SRM450		1	Woofer
490-047-00	SRM FRONT CASE MRB		1	Front case
490-048-00	SRM REAR CASE MRB		1	Rear case
490-052-00	POLE MNT KNOB		1	
490-053-00	FOAM D BLK&WHT		1	
550-408-00	TOP HANDLE PA SPKR		1	Top handle
550-410-00	GRILL 12IN SPKR ACTIVE	B	1	Grill
700-123-00	SCREW SIDE HDL GRIP MNTG		4	
700-124-00	SCREW HDL MNTG TO CASE		4	
700-125-00	SCREW WOOFER		8	
701-021-00	6X3/8 PHP PLASTITE BLK	A	4	
701-026-00	SCREWS FOR CASE		17	
701-027-00	SCREW BACK PANEL		12	
701-028-00	SCREW FEET GRILL CD-THR		13	
701-029-00	SCREW PCB ASSY LED		1	
705-031-00	FLYING HW INS NUTS GALV		8	
705-032-00	FLYING HW INS NUTS BLK		2	
710-049-00	WASH HDL MTNG TO CASE		4	
710-050-00	WASH FLAT WOOFER		8	
710-051-00	FLYING HW INS WASH GALV		8	
710-052-00	FLYING HW INS WASH BLK		2	
712-068-00	FLYING HW INSERTS		10	
712-069-00	GROMMET LEAD WIRE		1	
750-015-00	FEET		3	
760-115-00	SIDE HANDLE GRIP SRM450	A	2	
760-116-00	PLASTIC SIDE HANDLE	A	2	
780-135-00	GASKET WOOFER SRM450		1	Woofer Gasket
780-138-00	FOAM DA COMP DR TO CASE		1	
780-139-00	FOAM D COMP D TO THROAT		1	
780-140-00	GASKET FOR SPEAKER		1	
790-010-00	BAG 20 X 7 X 48 4MIL GUSS		1	
800-141-00	BOX SRM450		1	
810-088-00	CARDBD BTTM SRM450/C300		1	
810-089-00	TRIANG INS SRM450/C300		1	
840-249-00	LBL LOGO SPKR FRONT	A	1	
840-250-00	LBL LOGO SPKR RUNNING MAN	A	1	
840-251-00	LBL SPKR PWR ACTIVE	A	1	
840-314-00	LBL INSERT COVER SRM450	A	10	

055-227-00 Main pcb assembly

PART NO.	DESCRIPTION	VALUE		REFERENCE DESIGNATORS
040-311-00	DIS 18GA 1010 GNYL 5 HKLG			P1
100-084-00	RES CF .125W 5% 30K OHM	30K	5%	R189 R215
105 464 00	RES MF .125W 1% 60K4 OHM	60K4	1%	R177 R203
110-025-00	RES CF .25W 5% 100 OHM	100	5%	R266
115-361-00	RES MF .25W 1% 5K11 OHM	5K11	1%	R156 R238
115-364-00	RES MF .25W 1% 6K04 OHM	6K04	1%	R25 R45 R78
115-389-00	RES MF .25W 1% 10K0 OHM	10K0	1%	R256
115-418-00	RESISTOR CF 20K0 1%	20K0	1%	R220 R222
120-097-00	RES MO .5W 5% 10K OHM	10K	5%	R261 R263-264
122-081-00	RES MO 2W 5% 2K2 OHM	2K2	5%	R254-255
123-009-00	RES MO 3W 5% .22 OHM	0.22	5%	R183 R240 R249 R260
123-056-00	RES MO 3W 5% 20 OHM	20	5%	R248 R262
125-030-00	RES WW 5W 5% .22 OHM	.22	5%	R152 R201
130-021-00	POT TRIM 10KB HORIZ	10KB		R62 R267
130-038-00	POT TRIM 500B HORIZ	500-B		R202 R212
130-078-02	POT 12MM DUAL 10KZD REVLOG	10KZD		R265
140-025-00	RES TF SM .1W 5% 10 OHM	10	5%	R22
140-042-00	RES TF SM .1W 5% 51 OHM	51	5%	R157 R237
140-049-00	RES TF SM .1W 5% 100 OHM	100	5%	R1-2 R29 R115 R140 R162
140-066-00	RES TF SM .1W 5% 510 OHM	510	5%	R47-48 R55-56
140-073-00	RES TF SM .1W 5% 1K0 OHM	1K0	5%	R226 R246
140-080-00	RES TF SM .1W 5% 2K0 OHM	2K	5%	R14
140-097-00	RES TF SM .1W 5% 10K OHM	10K	5%	R35 R61 R63-64 R85
140-112-00	RES TF SM .1W 5% 39K OHM	39K	5%	R107
140-115-00	RES TF SM .1W 5% 51K OHM	51K	5%	R70
140-119-00	RES TF SM .1W 5% 75K	75K	5%	R71
140-123-00	RES TF SM .1W 5% 100K OHM	100K	5%	R26 R57-60 R93
140-147-00	RES TF SM .1W 5% 1M OHM	1M	5%	R75
145-162-00	RES MF SM .1W 1% 47R5 OHM	47R5	1%	R6 R145 R223-224 R231-232 R242-244 R247 R275
145-193-00	RES MF SM .1W 1% 100 OHM	100	1%	R28
145-210-00	RESISTOR MF SMT	150	1%	R173 R193 R196 R221
145-226-00	RES MF SM .1W 1% 221 OHM	221	1%	R76 R191 R217
145-234-00	RES MF SM .1W 1% 267 OHM	267	1%	R138
145-239-00	RES MF SM .1W 1% 301 OHM	301	1%	R158 R176 R184 R200 R208 R214 R233 R235 R239 R241 R250 R257
145-246-00	RES MF SM .1W 1% 357 OHM	357	1%	R280
145-255-00	RES MF SM .1W 1% 442 OHM	442	1%	R174-175 R197-198
145-258-00	RES MF SM .1W 1% 475 OHM	475	1%	R72
145-268-00	RES MF SM .1W 1% 604 OHM	604	1%	R218 R229
145-277-00	RES MF SM .1W 1% 750 OHM	750	1%	R182 R210
145-281-00	RES MF SM .1W 1% 825 OHM	825	1%	R27
145-289-00	RES MF SM .1W 1% 1K00 OHM	1K00	1%	R20-21 R83
145-312-00	RES MF SM .1W 1% 1K74 OHM	1K74	1%	R126
145-314-00	RES MF SM .1W 1% 1K82 OHM	1K82	1%	R230 R234 R251 R258
145-326-00	RES MF SM .1W 1% 2K21 OHM	2K21	1%	R204 R209
145-331-00	RES MF SM .1W 1% 2K49 OHM	2K49	1%	R13 R73 R109 R141 R146 R154 R171-172 R190 R192 R194-195 R216 R219
145-335-00	RES MF SM .1W 1% 2K74 OHM	2K74	1%	R18
145-339-00	RES MF SM .1W 1% 3K01 OHM	3K01	1%	R137
145-341-00	RES MF SM .1W 1% 3K16 OHM	3K16	1%	R87
145-346-00	RES MF SM .1W 1% 3K57 OHM	3K57	1%	R84 R276
145-350-00	RES MF SM .1W 1% 3K92 OHM	3K92	1%	R116 R160
145-354-00	RES MF SM .1W 1% 4K32 OHM	4K32	1%	R123 R153
145-356-00	RES MF SM .1W 1% 4K53 OHM	4K53	1%	R38 R40 R43-44 R90-92 R94-97 R103 R105-106

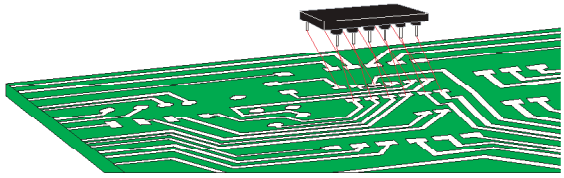
PART NO.	DESCRIPTION	VALUE		REFERENCE DESIGNATORS
145-358-00	RES MF SM .1W 1% 4K75 OHM	4K75	1%	R42 R99-100
145-361-00	RES MF SM .1W 1% 5K11 OHM	5K11	1%	R3-4 R9 R11 R30 R66-69 R79-81 R102 R120 R124 R127 R142
145-369-00	RES MF SM .1W 1% 6K19 OHM	6K19	1%	R15
145-371-00	RES MF SM .1W 1% 6K49 OHM	6K49	1%	R111-112 R159
145-373-00	RES MF SM .1W 1% 6K81 OHM	6K81	1%	R136
145-375-00	RES MF SM .1W 1% 7K32 OHM	7K32	1%	R89
145-377-00	RES MF SM .1W 1% 7K50 OHM	7K50	1%	R46 R98 R101 R169
145-381-00	RES MF SM .1W 1% 8K25 OHM	8K25	1%	R139
145-384-00	RES MF SM .1W 1% 8K87 OHM	8K87	1%	R37
145-389-00	RES MF SM .1W 1% 10K0 OHM	10K0	1%	R7-8 R19 R23-24 R31-33 R36 R88 R108 R117 R129 R132-133 R143 R161 R165 R268-273
145-390-00	RES MF SM .1W 1% 10K2 OHM	10K2	1%	R150-151 R274
145-394-00	RES MF SM .1W 1% 11K3 OHM	11K3	1%	R148
145-395-00	RES MF SM .1W 1% 11K5 OHM	11K5	1%	R134
145-406-00	RES MF SM .1W 1% 15K0 OHM	15K0	1%	R16 R34 R135
145-409-00	RES MF SM .1W 1% 16K2 OHM	16K2	1%	R119 R281
145-412-00	RES MF SM .1W 1% 17K4 OHM	17K4	1%	R279
145-418-00	RES MF SM .1W 1% 20K0 OHM	20K0	1%	R41 R121-122 R144 R167 R170 R225 R227-228 R245 R252-253 R259
145-422-00	RES MF SM .1W 1% 22K1 OHM	22K1	1%	R5 R12
145-435-00	RES MF SM .1W 1% 30K1 OHM	30K1	1%	R50 R53-54 R113-114 R125
145-437-00	RES MF SM .1W 1% 31K6 OHM	31K6	1%	R277
145-439-00	RES MF SM .1W 1% 33K2 OHM	33K2	1%	R74
145-441-00	RES MF SM .1W 1% 34K8 OHM	34K8	1%	R278
145 442 00	RES MF SM .1W 1% 35K7 OHM	35K7	1%	R49 R52
145-454-00	RES MF SM .1W 1% 47K5 OHM	47K5	1%	R10 R77
145-471-00	RES MF SM .1W 1% 71K5 OHM	71K5	1%	R39 R51
145-473-00	RES MF SM .1W 1% 75K0 OHM	75K0	1%	R118 R147 R163
145-477-00	RES MF SM .1W 1% 82K5 OHM	82K5	1%	R128 R166
145-479-00	RES MF SM .1W 1% 86K6 OHM	86K6	1%	R86
145-485-00	RES MF SM .1W 1% 100K OHM	100K	1%	R110 R168
145-498-00	RES MF SM .1W 1% 137K OHM	137K	1%	R104
145-514-00	RES MF SM .1W 1% 200K OHM	200K	1%	R17
145-518-00	RES MF SM .1W 1% 221K OHM	221K	1%	R65
145-522-00	RES MF SM .1W 1% 243K OHM	243K	1%	R130
145-550-00	RES MF SM .1W 1% 475K OHM	475K	1%	R155
145-553-00	RES MF SM .1W 1% 511K OHM	511K	1%	R131
145-560-00	RES MF SM .1W 1% 604K OHM	604K	1%	R149
145-565-00	RES MF SM .1W 1% 681K OHM	681K	1%	R82
⚠ 150-009-00	RES FUS .25W 5% 2.2 OHM	2.2	5%	R164 R178 R180 R206 R211 R236
⚠ 150-037-00	RES FUS .25W 5% 33 OHM	33	5%	R179 R181 R186-188 R199 R207 R213
⚠ 150-045-00	RES FUS .25W 5% 68 OHM	68	5%	R185 R205

PART NO.	DESCRIPTION	VALUE		REFERENCE DESIGNATORS
200-004-02	PLY .047UF 10% 100V TR	0.047	10%	C130 C141
200-023-00	PLY/BX .001UF 20% 250V Y2	.001uF	20%	C168 C169
200-024-00	PLY/BX .01UF 20% 250V Y2	.01uF	20%	C172
200-027-02	PLY .1UF 5% 100V TR	0.1	5%	C118 C123 C128 C133 C136 C144-145 C152 C163 164
200-041-00	PLY/FL .01UF 10% 250V	0.01	10%	C162 C167
200-042-02	PLY/BX .22UF 10%250V TR	0.22	10%	C174-175 C177-178
205-001-02	MICA 180PF 5% 500V T/A	180pF	5%	C131 C143
205-002-02	MICA 270PF 5% 500V TR	270pF	5%	C129 C140
212-001-00	CER .01UF 10% 50V X7R SM	0.01	10%	C2 C10 C16-17 C19 C23 C28-29 C31-32 C34 C36 C38-39 C41 C45-46 C48-50 C54-55 C57 C59 C63-65 C67 C69-70 C72 C77-79 C85 C87 C92 C95 C98 C101-102 C108-111 C114 C124-125 C138 C142 C151
212-003-00	CER 100PF 5% 50V NPO SM	100PF	5%	C8 C52-53 C56 C74 C81 C90
212-004-00	CER 220PF 5% 50V NPO SM	220PF	5%	C6-7 C51 C100
212-006-00	CER 470PF 5% 50V NPO SM	470PF	5%	C22 C27
212-010-00	CER .1 +80/-20 25V Z5U SM	.1UF	-400	C26 C61
212-020-00	CER 750PF 5% 50V NPO SM	750PF		C89 C121 C127 C134-135 C148 C154
212-021-00	CER 27PF 5% 50V NPO SM	27pF		C147
212-023-00	CER .001UF 10% 50V NPO SM	0.001	10%	C3-5 C120 C150 C155 C160
212-035-00	CER 560PF 5% 50V NPO SM	560PF	5%	C42-43 C82-83
212-041-00	CER 75PF 50V NPO 0805	75pF		C137
220-001-02	LYT 22UF 20% 25V RAD TR	22UF	10%	C96 C126
220-002-02	LYT 47UF 20% 25V RAD TR	47UF	20%	C13 C24-25 C30 C35 C47 C119 C146 C149 C153 C157-159
220-004-02	LYT 470UF 20% 6.3V RAD TR	470UF	10%	C1
220-005-02	LYT 470UF 20% 25V RAD TR	470UF	10%	C156 C165
220-027-02	LYT 10UF 20% 50V RAD TR	10UF	10%	C80 C88 C94 C122 C132 C139 C176
220-030-00	LYT 1000UF 20% 6.3V RAD	1000UF	10%	C161
220-051-00	LYT 6800UF 20% 50V RAD	6,800UF	20%	C166 C170-171 C173
224-002-00	PLY .0012UF 2% 50V SM	0.0012	2.00%	C18 C99 C115
224-003-00	PLY .0018UF 2% 50V SM	0.0018	2.00%	C112
224-006-00	PLY .0047UF 2% 50V SM	0.0047	2.00%	C33 C60 C66 C68 C71 C97
224-007-00	PLY .0068UF 2% 50V SM	0.0068	2.00%	C91 C93 C180-181
224-009-00	PLY .01UF 2% 50V SM	0.01	2.00%	C9 C11 C103-105 C179
224-010-00	PLY .1UF 2% 50V SM	0.1	2.00%	C84 C116
224-013-00	PLY .015UF 2% 50V SM	0.015	2.00%	C113
224-014-00	PLY .033UF 2% 50V SM	0.033	2.00%	C73
224-015-00	PLY .047UF 2% 50V SM	0.047	2.00%	C12 C14 C76 C86
224-016-00	PLY 470PF 2% 50V SM	470pf	2.00%	C58 C106
224-017-00	PLY .0015UF 2% 50V SM	0.0015	2.00%	C107
224-021-00	PLY .33UF 5% 16V SM	0.33	5%	C62 C75
224-024-00	PLY 560PF 2% 50V SM	560PF	2.00%	C15
224-025-00	PLY .068UF 2% 50V SM	0.068	2.00%	C117
224-026-00	PLY .056UF 2% 50V SM	0.056	2.00%	C21 C37 C44
224-031-00	PLY .0056UF 2% 50V SM	0.0056	2.00%	C40
224-034-00	PLY .47UF 5% 16V SM	0.47	5%	C20

Components noted with this symbol shall be replaced only by the component specified. This is required to maintain product safety.

PART NO.	DESCRIPTION	VALUE	REFERENCE DESIGNATORS
300-003-00	DIO SW DL4148 100V SM	DL4148	D1-15 D19-21 D23-25 D27-31 D35 D37-41 D44 D47-48 D54
300-010-00	DIO SIG RLS245 220V 200MA	RLS245	D26 D32 D34 D36
301-019-00	DIO PWR BRDG 25A 400V SIP	25A	D55-56
301-021-00	DIO PWR DL4004 SM	DL4004	D16 D22 D33 D42 D45 D52 D57
301-023-00	DIO PWR SR505	SR505	D50-51
302-025-03	DIO ZEN DL5245B 15V SMT	DL5245B	D17-18 D43 D49
302-026-00	DIO ZEN 1N4744A 15V 1W	1N4744	D46 D53
304-027-02	LED RED W/.425 SPACER TR	RED	D59 D61
304-029-02	LED GRN W/.425 SPACER TR	GRN	D58 D60
310-014-00	XSTR PNP MJE2955	A	Q34 *
310-015-00	XSTR NPN MJE3055	A	Q35 *
310-024-00	XSTR PNP 2SB817	2SB817	Q3 Q32
310-025-00	XSTR NPN 2SD1047	2SD1047	Q8 Q21
310-028-00	XSTR PNP 2SB940A POWER	2SB940A	Q10 Q19 Q34 (Q34 may be a MJE2955) *
310-029-00	XSTR NPN 2SD1264A POWER	2SD1264A	Q9 Q20 Q35 (Q35 may be a MJE3055) *
310-035-00	XSTR PNP 2SA1478	2SA1478	Q23
310-036-00	XSTR NPN 2SC3788	2SC3788	Q12
310-037-00	XSTR NPN MJE340 POWER	MJE340	Q14-15
310-038-00	XSTR PNP MJE350	MJE350	Q4-5
310-050-00	XSTR NPN 2SC1567A	2SC1567A	Q11 Q18
310-053-00	XSTR MOSFET PCH IRFP9140N	IRFP9140N	Q33
310-054-00	XSTR MOSFET IRFP150N	IRFP150N	Q2
311-001-00	XSTR NPN IMBT4401 SM	IMBT4401	Q1 Q29 Q42
311-002-00	XSTR PNP MMST4403 SM	IMBT4403	Q30-31 Q41 Q43
311-007-00	XSTR PNP 2SA1415	2SA1415	Q6 Q17 Q22 Q24
311-008-00	XSTR NPN 2SC3645	2SC3645	Q7 Q13 Q16 Q36
311-019-00	XSTR PNP 2SB792 SM	2SB792	Q27-28 Q39-40
311-020-00	XSTR NPN 2SD814	2SD814	Q25-26 Q37-38
320-006-00	OPAMP 2068E	NJM 2068	U3 U20
320-012-00	OPAMP NJM4560M	NJM4560M	U1-2 U4 U6-8 U10-19 U21-26
320-015-00	IC, VCA	SSM2164SMD	U9
323-002-00	LM339D QUAD COMP SM	LM339	U5
400-041-00	XLR VERT MALE PCMNT		J18
400-060-00	FUSE CLIP PCMT		Z4-5
400-132-00	IEC MALE RTA PCMT		J1
400-133-00	HDR 6CK 11A/600V		J12
400-139-00	SHUNT 2P .100		Z11
400 163 00	HDR 4P .165X2 M V W/PEGS		J16
400-171-00	HDR 2P .100X1 STR		J6-8 J15 J20-21
400-173-00	TERM .25 QKDS PCMT STABLE		J2-5
400-223-00	XLR PCMNT NEUTRIK-AP SER		J17
400-243-00	HDR 2P .098X1 SHRD		J13 Z100
400-307-00	HDR 6P .098X1 SHRD RTA		J14
450-227-00	PCB, SRM450: AMPLIFIER		Z50
500-026-00	THERMOSTAT 67F070 PCMNT	67F070	TH1
500-037-00	SWITCH 2PDT PUSH V SNAPIN	2P2T	SW1-3
510-013-00	FUSE SB 7A 5X20MM 250V	A 1	F1 For 120V units
510-011-00	FUSE SB 4A 5X20 250V IEC	B 1	F1 For 230V units
510-024-00	FUSE SB 8A 5X20MM 250V	A 1	F1 For 100V units
620-025-00	CBL 3P .100 3.25IN		J19
706-033-10	STDF SWAGE NO.4 X .527L F		SO1-3
712-021-01	RVT CL END .125X.062-.125		Z6
712-062-00	BRKT ANG 6-32 ONE HOLE		Z104
760-107-00	BTN 2 COLOR 9X5MM		Z8-10

Components noted with this symbol shall be replaced only by the component specified. This is required to maintain product safety.



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SRM450 Bias Adjustment, sheet 1 of 2

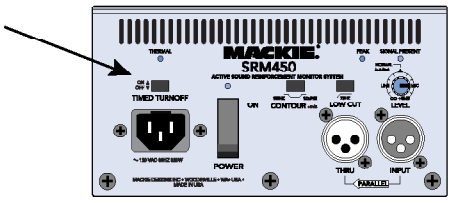
Model: SRM450 Active Speaker Serial Number: ALL Effective: June 1999

Problem: The Amplifier Bias of every SRM450 must be carefully adjusted as follows.

Procedure:

1. Place the SRM450 on its side so that the heatsink fins are horizontal.

2. Connect the power cord and turn it on, with no input signal applied. Make sure that the TIMED TURNOFF switch is OFF.



3. Let it sit this way for an hour or more to allow the heatsink temperature to rise. You can play music through to speed things up.
If you have a thermometer, the bias adjustment procedure is best done when the heatsink temperature is 45 to 50 deg C.

4. Turn off the SRM450 and remove the power cord.

5. Remove the complete amplifier/heatsink assembly from the plastic speaker case but leave all wires connected, including the speaker wires. Support the amplifier so it can be safely turned on again.

6. Replace the power cord and turn on the amplifier and **take care** not to touch any exposed live AC components.

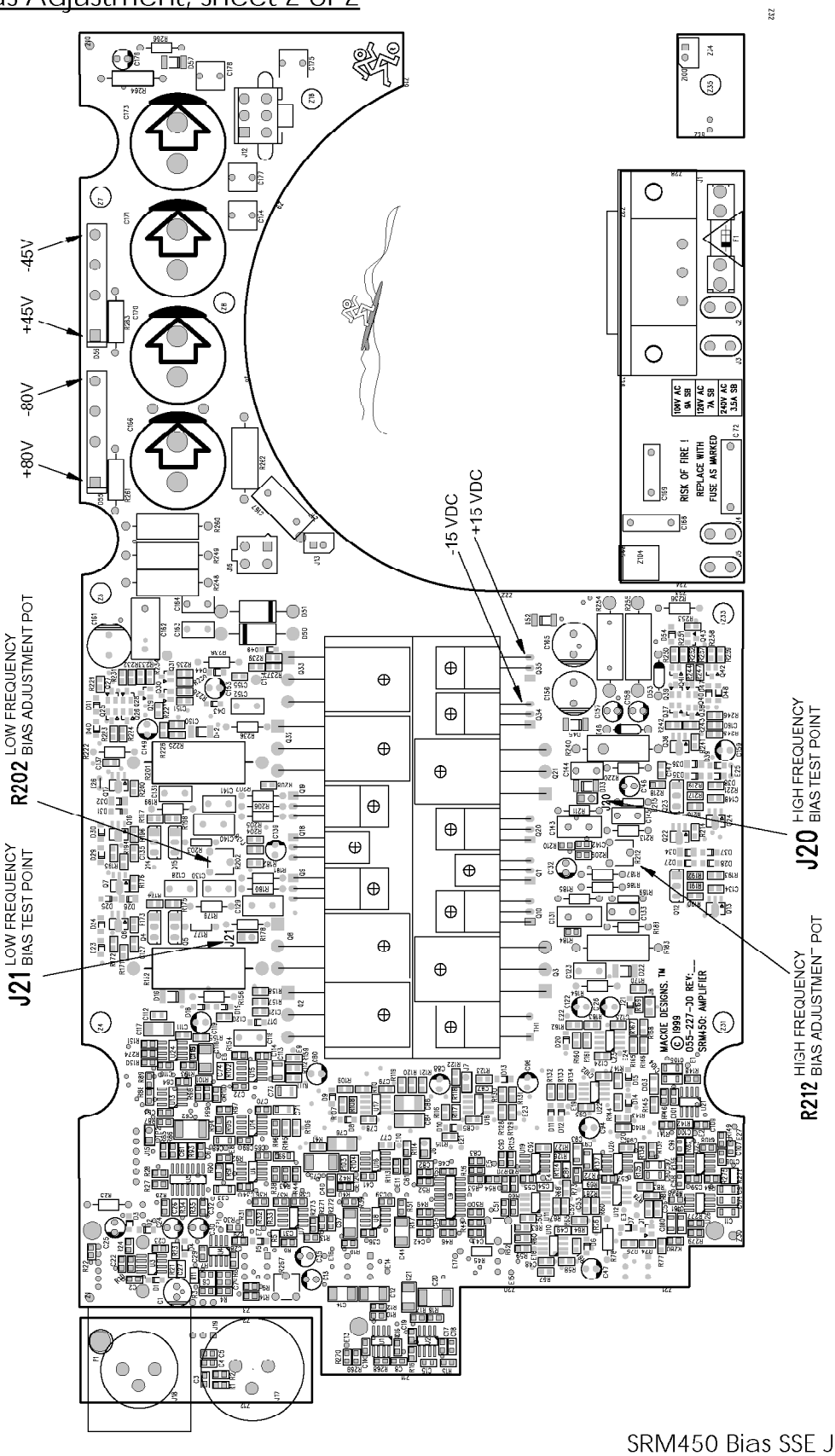
7. No input signal is applied.

8. Low frequency amplifier bias adjustment:
While the heatsink is still warm, measure the DC voltage across the 2 pins of J21. Adjust R202 until a reading of 4mV to 4.5mV is reached.
See sheet 2 for the location of J21 and R202.
Important: When finished adjusting, secure R202 with a small drop of paint, such as nail varnish.

9. High frequency amplifier bias adjustment:
Measure the DC voltage across the 2 pins of J20. Adjust R212 until a reading of 4mV to 4.5mV is reached.
Important: Secure R212 with a small drop of paint.

10. This completes the adjustment procedure. Reassemble and perform a full test.

SRM450 Bias Adjustment, sheet 2 of 2



Description	Rev	Date
Initial Release	A	

SRM450 Pole Mount Insert Rework Instructions

851-033-00 REV A

Prepared by: _____Date: _____
Chad Trani Manufacturing Engineer

Approved by: _____Date: _____
Ray Vancour Field Service Manager

Approved by: _____Date: _____
John Ray Quality Assurance Manager

SRM450 Pole Mount Insert Rework Instructions

Note: These instructions are to be used along with Mackie kit P/N 020-006-00 to repair SRM450s which already have the pole mount insert stripped out. The pole mount bolt assembly (bolt, knurled brass insert and alignment bushing) must still be with the unit as the parts will be recycled and also used during the rework.

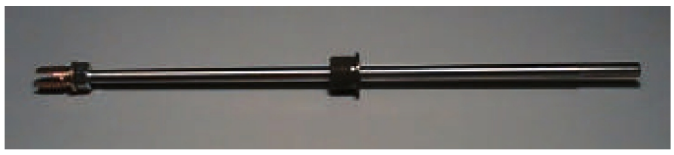
1) Remove stripped out pole mount bolt assembly. This can be done by hand – one or two sharp jerks on the bolt should pull the assembly free.

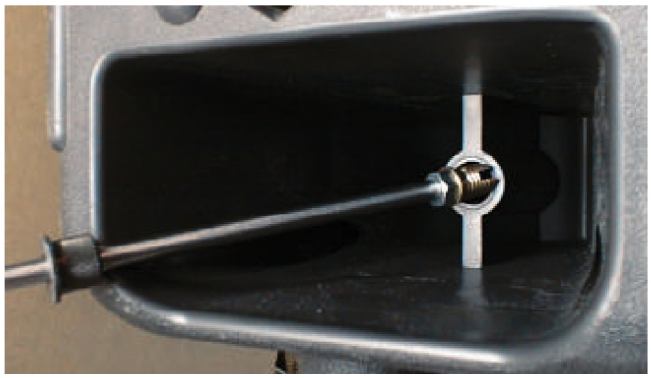
Pole Mount Bolt Assembly

2) Unscrew the defective brass knurled insert from the bolt and remove the black metal bolt bushing.
3) Screw the metric nut (M6x1.00) onto the insert installation tool until it stops.
4) Screw the new replacement threaded brass insert onto the end of the installation tool until it stops against the nut.

Replacement Insert
(Mackie P/N 712-073-00)

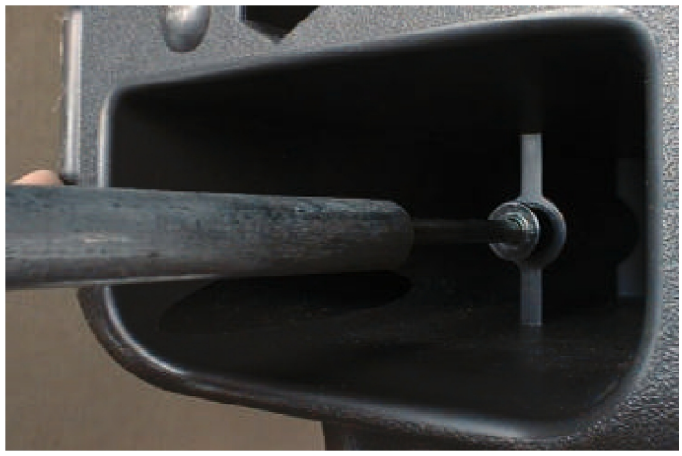
5) Slide the black metal bushing down onto the insert tool so it is behind the nut (shoulder on the bushing should be away from the nut) – this will be used to align the new insert during installation.





Installation Tool Assembly
Insert Installation

6) Place the tool (insert first) into the pole mount hole.
7) Using the small pipe, gently tap the bushing into place so it fits snug. The bushing only needs to be partially installed (as a guide) since it will be removed shortly. Rcmovc thc pipc.



Tapping bushing into place with pipe

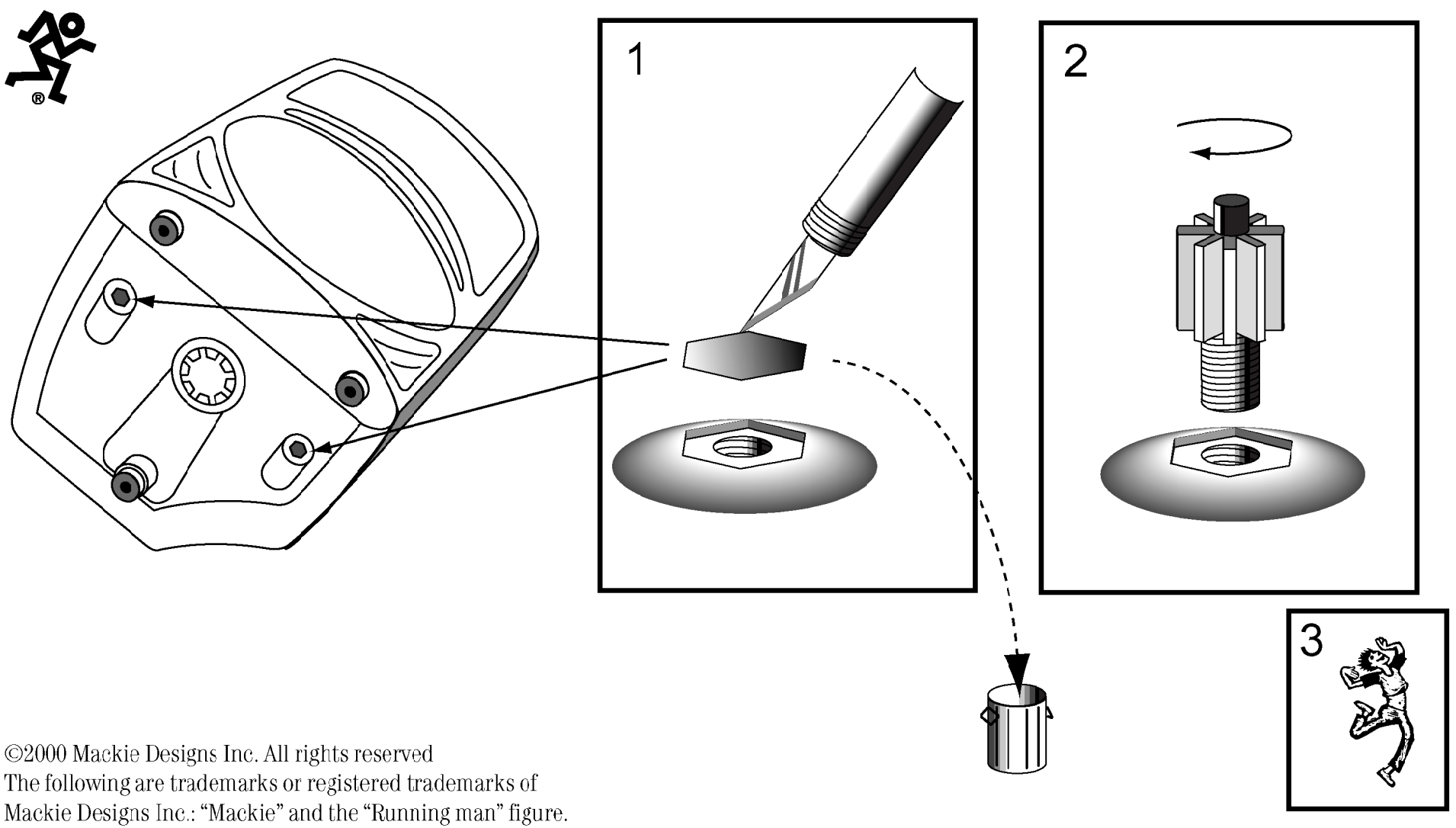
8) Attach drill or similar device to insert tool and drive insert into position clockwise. Insert will stop against shoulder when at correct installed depth. **NOTE: DO NOT drive the insert in fast! Doing so will damage the plastic hole and decrease the effectiveness of the repair. Drive the insert in relatively slowly while applying downward pressure. You will feel the new threaded insert (self-tapping) catch, start cutting and then bottom out once the shoulder contacts the bottom of the hole. Once you feel this, STOP! DO NOT force the insert past this bottoming out point or you will strip out the new threads.**

9) Reverse the drill and back the tool out. A quick, sharp twist once you start to back the tool out will break the tool free from the insert. You do not need to remove the tool slowly as with the installation. The metal bushing will easily pull out along with the installation tool.
10) Using a small flathead screwdriver or similar tool, remove the plastic chips from inside the pole mount hole on the bottom of the speaker. If compressed air is available, blow out the inside of the new threaded insert to remove any plastic chips that may be present.

Plastic burrs from insert installation

11) Take the installation tool out of the drill and remove the metric nut from the threaded end of the tool.
12) To reinstall the black metal bushing, screw the installation tool back into the insert a few threads and slide the bushing back down the tool – with the shoulder of the insert up. Again, using the piece of pipe, permanently tap the insert into place until it bottoms against the shoulder. Take care to reinstall the bushing straight.
13) Remove the insert tool and pipe.
14) Reinstall the original pole mount bolt. There may be some additional friction in the threads. This is due to plastic burrs protruding slightly through the slots in the insert – this friction will decrease the more the pole mount bolt is used.

MACKIE. SRM450/C300 stabilizing feet



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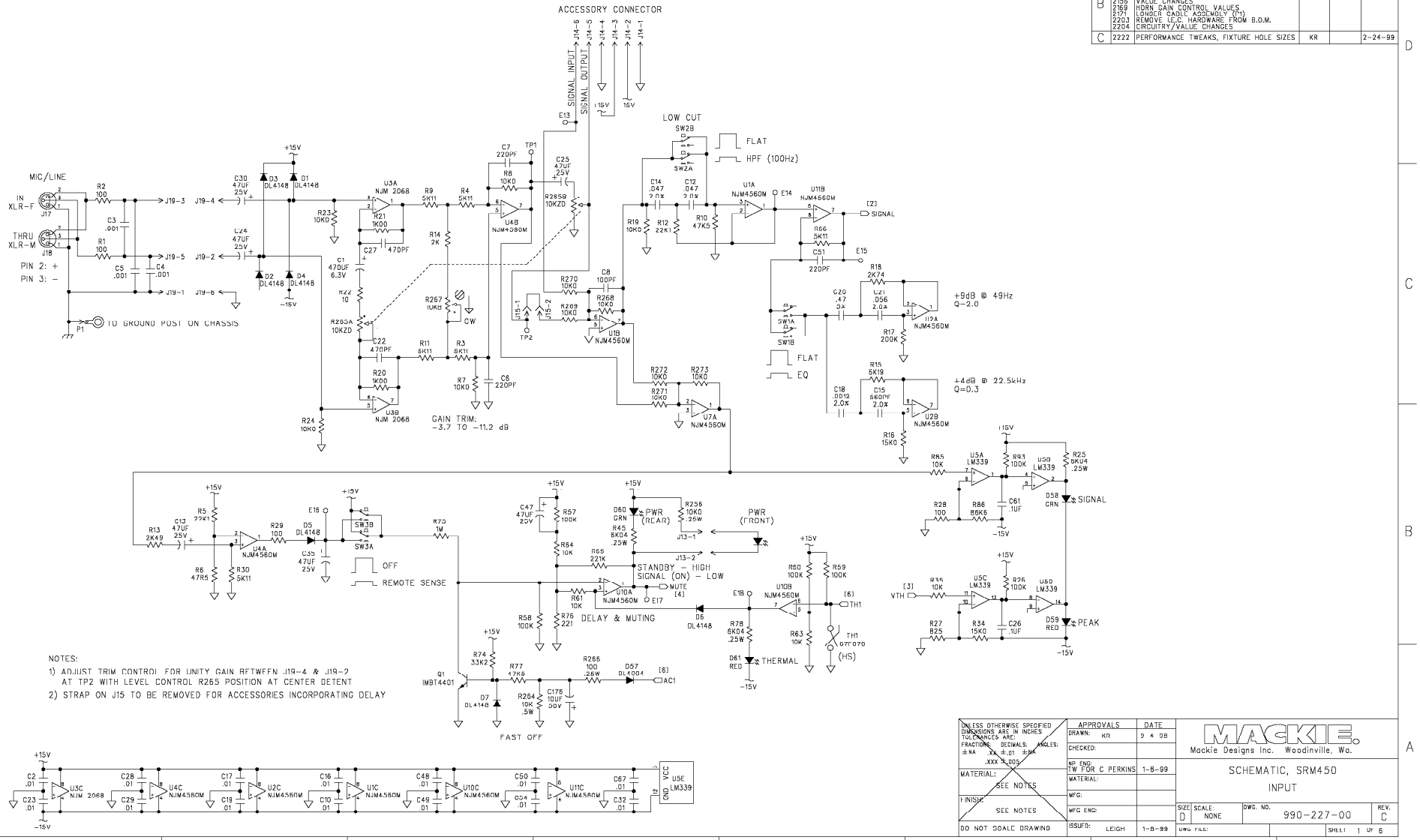
Part No. 820-158-01 Rev A 8/2000



REV:	ECO#	DESCRIPTION	REV. BY:	APP. BY:	DATE
B	2151	CHANGE STANDOFFS	KR		2-11-99
	2156	VALUE CHANGES			
	2169	HORN GAIN CONTROL VALUES			
	2171	LONGER CABLE ASSEMBLY (J1)			
	2203	REMOVE LE.C HARDWARE FROM B.O.M.			
	2204	CIRCUITRY/VALUE CHANGES			
C	2222	PERFORMANCE TWEAKS, FIXTURE HOLE SIZES	KR		2-24-99

DWG. NO. 990-227-00 | SHT 1 | REV. C

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS: ±NA DECIMALS: .XX ±.01 .XXX ±.005 ANGLES: ±NA
MATERIAL: SEE NOTES
FINISH: SEE NOTES
DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN: KR	9 4 98
CHECKED:	
NP ENG: TW FOR C PERKINS	1-8-99
MATERIAL:	
MFG.	
MFG ENG:	
ISSUED: LEIGH	1-8-99

Mackie Designs Inc. Woodinville, Wa.

SCHEMATIC, SRM450
INPUT

SIZE D | SCALE: NONE | DWG. NO. 990-227-00 | REV. C | DWG FILE: | SHEET 1 OF 6

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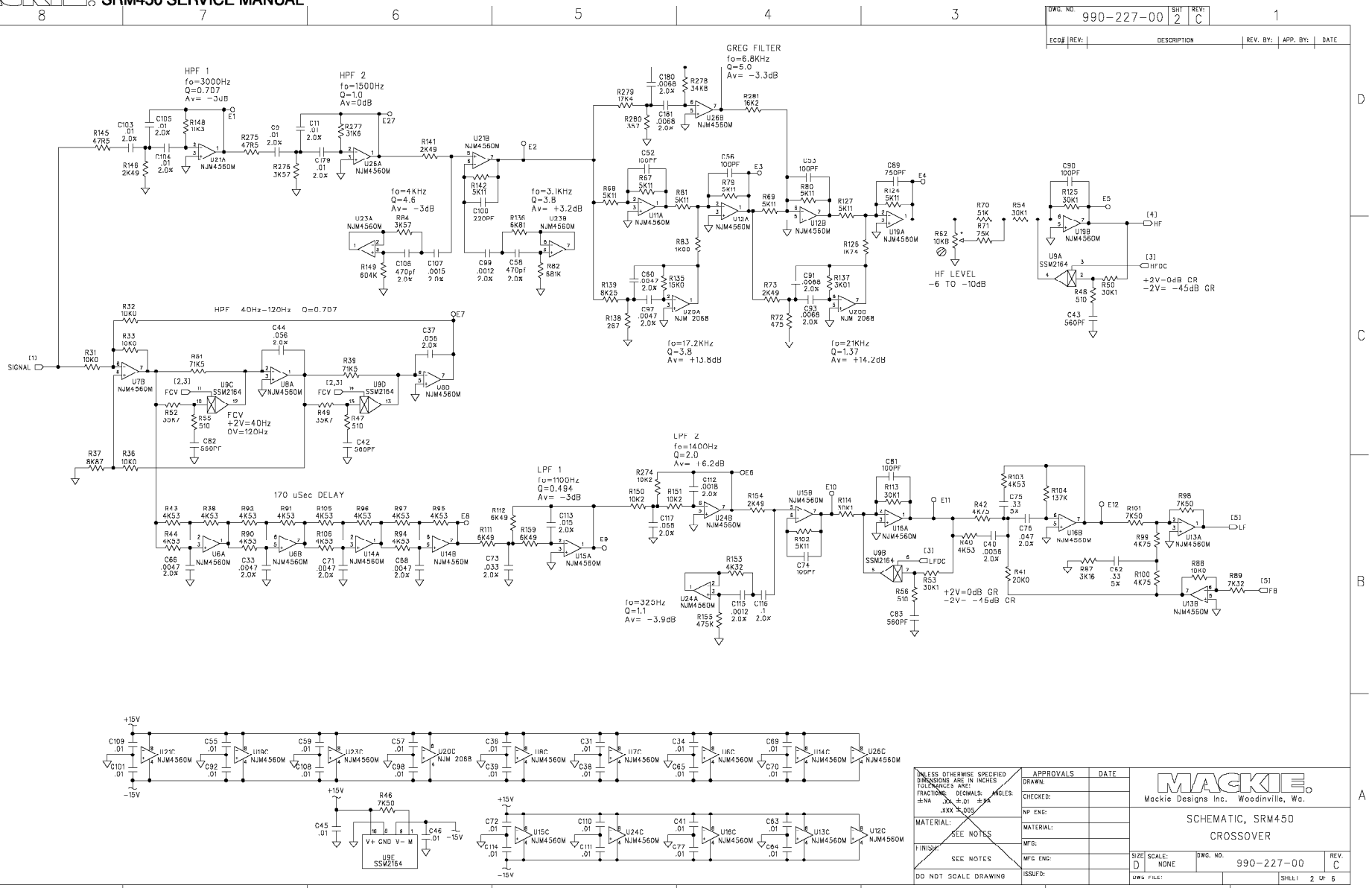

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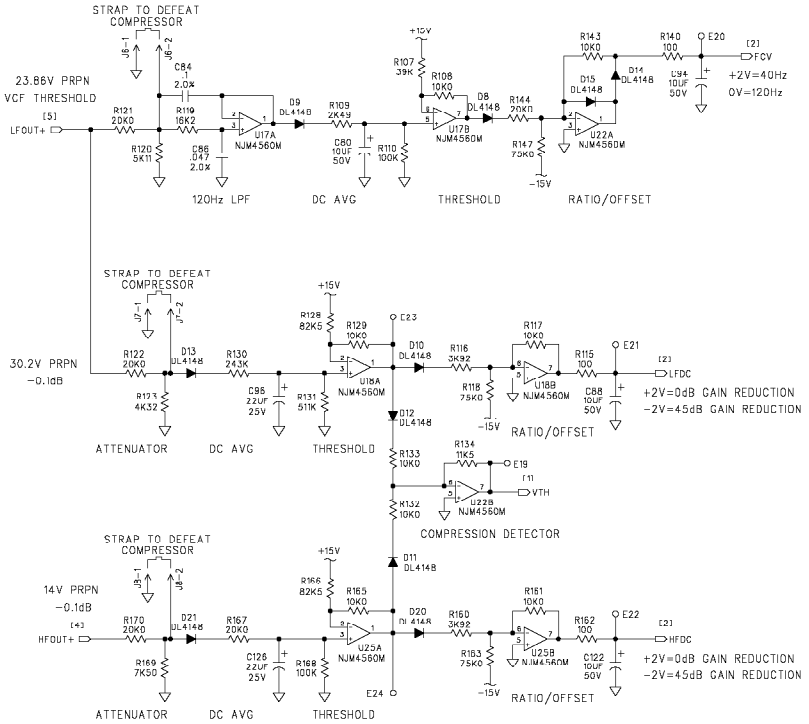

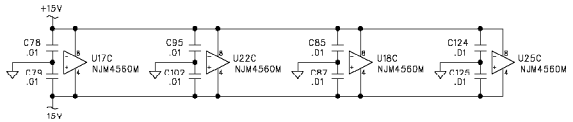

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS: DECIMALS: ANGLES: ±NA .XX ±.01 ±NA .XXX ±.005	APPROVALS	DATE
MATERIAL: SEE NOTES	DRAWN:	
FINISH: SEE NOTES	CHECKED:	
DO NOT SCALE DRAWING	NP ENG:	
	MATERIAL:	
	MFG:	
	MFG ENG:	
	ISSUED:	

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SCHEMATIC, SRM450
CONTROL CIRCUITS

SIZE	SCALE:	DWG. NO.	REV.
D	NONE	990-227-00	C

DWG FILE: SHEET 3 OF 6

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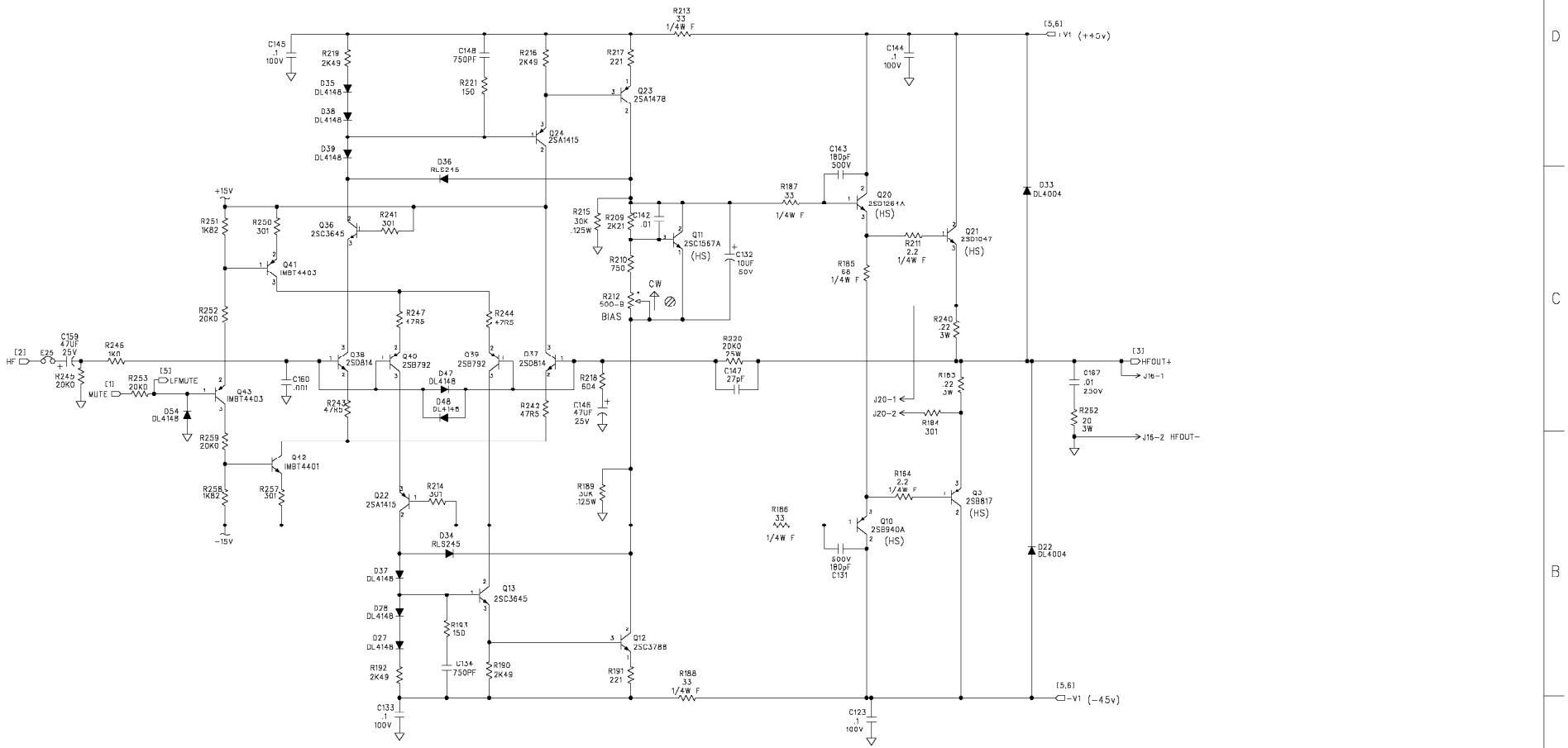

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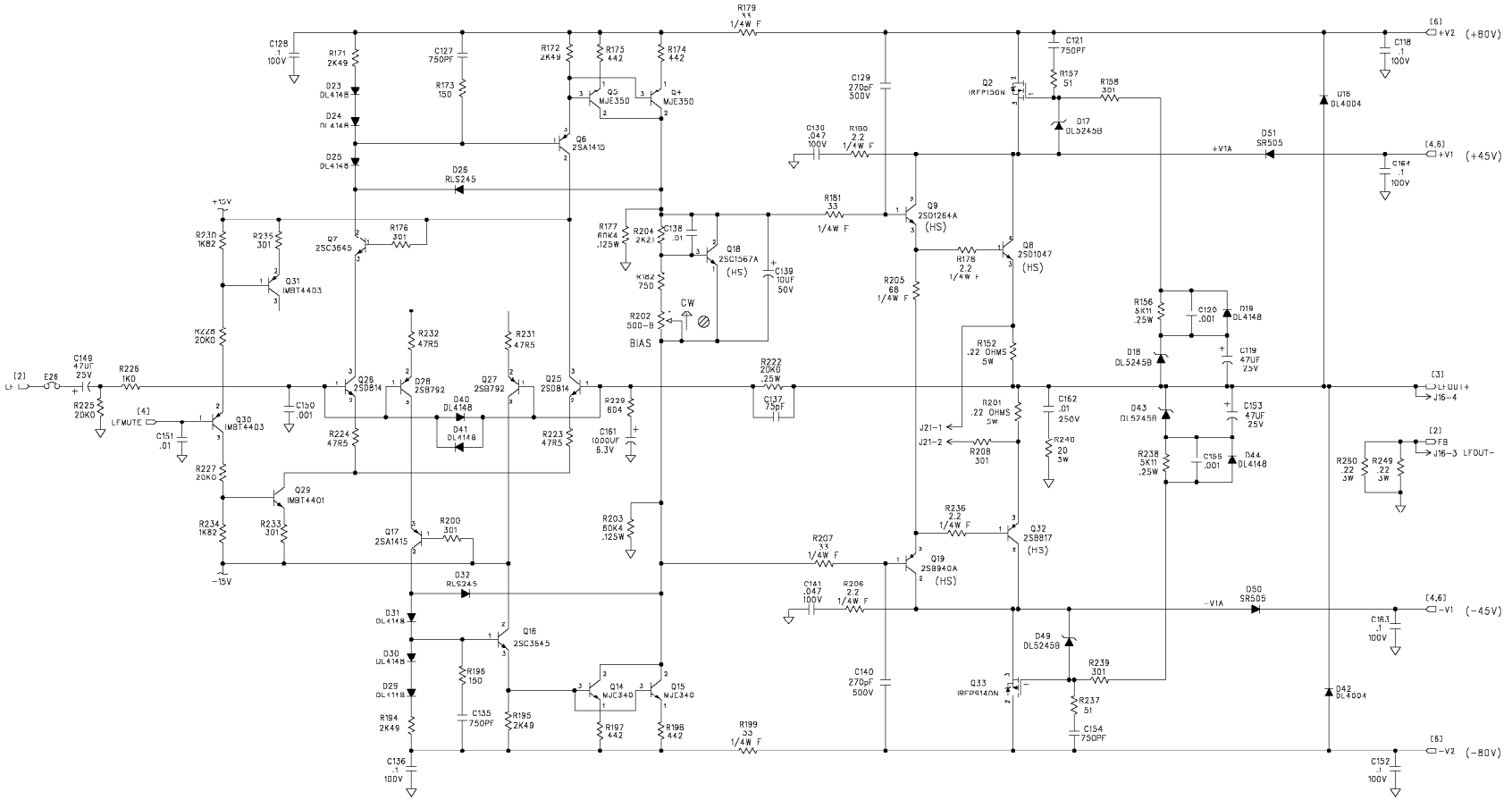

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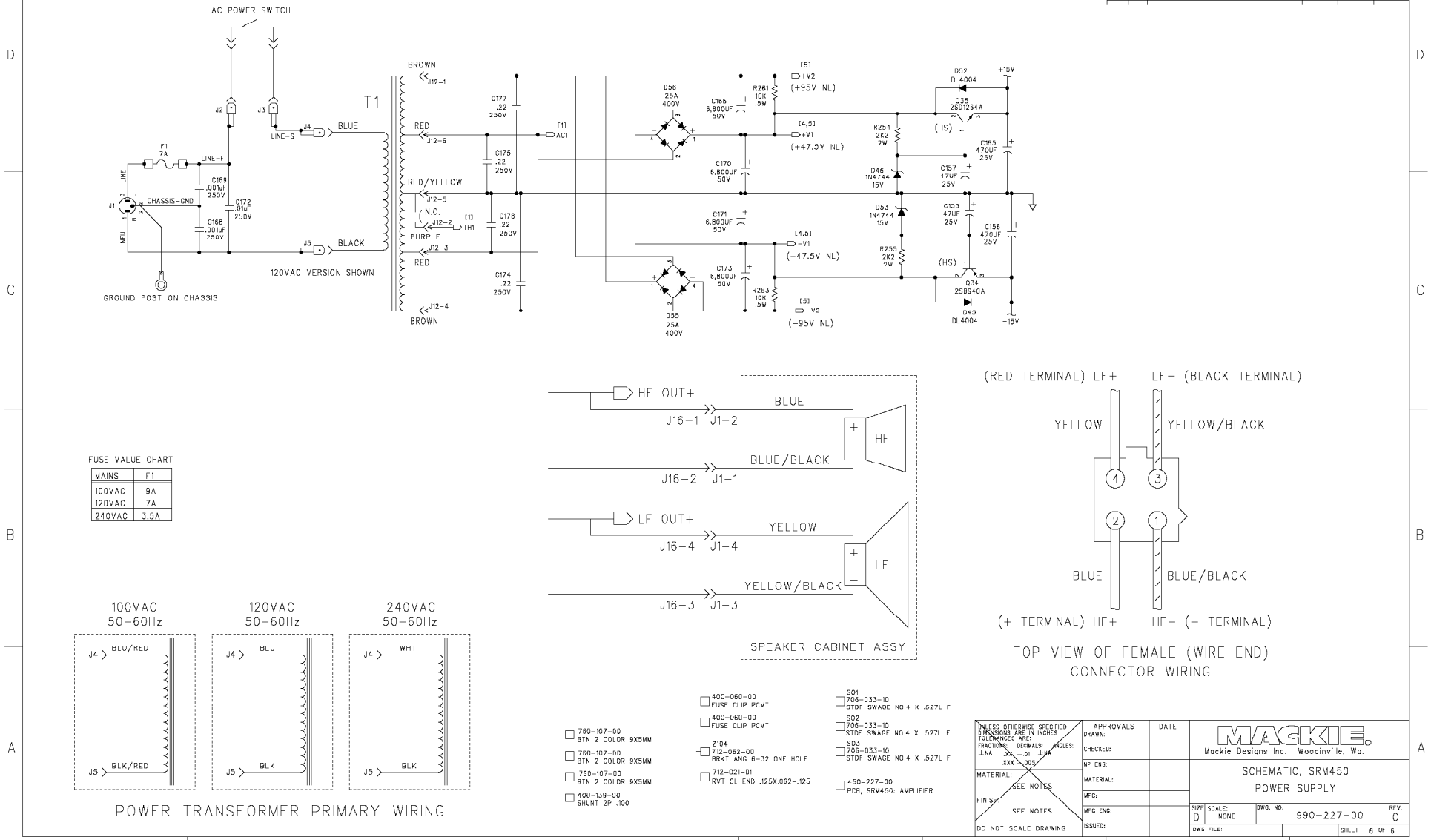
MAIN BOARD 227 Rev C

227-5



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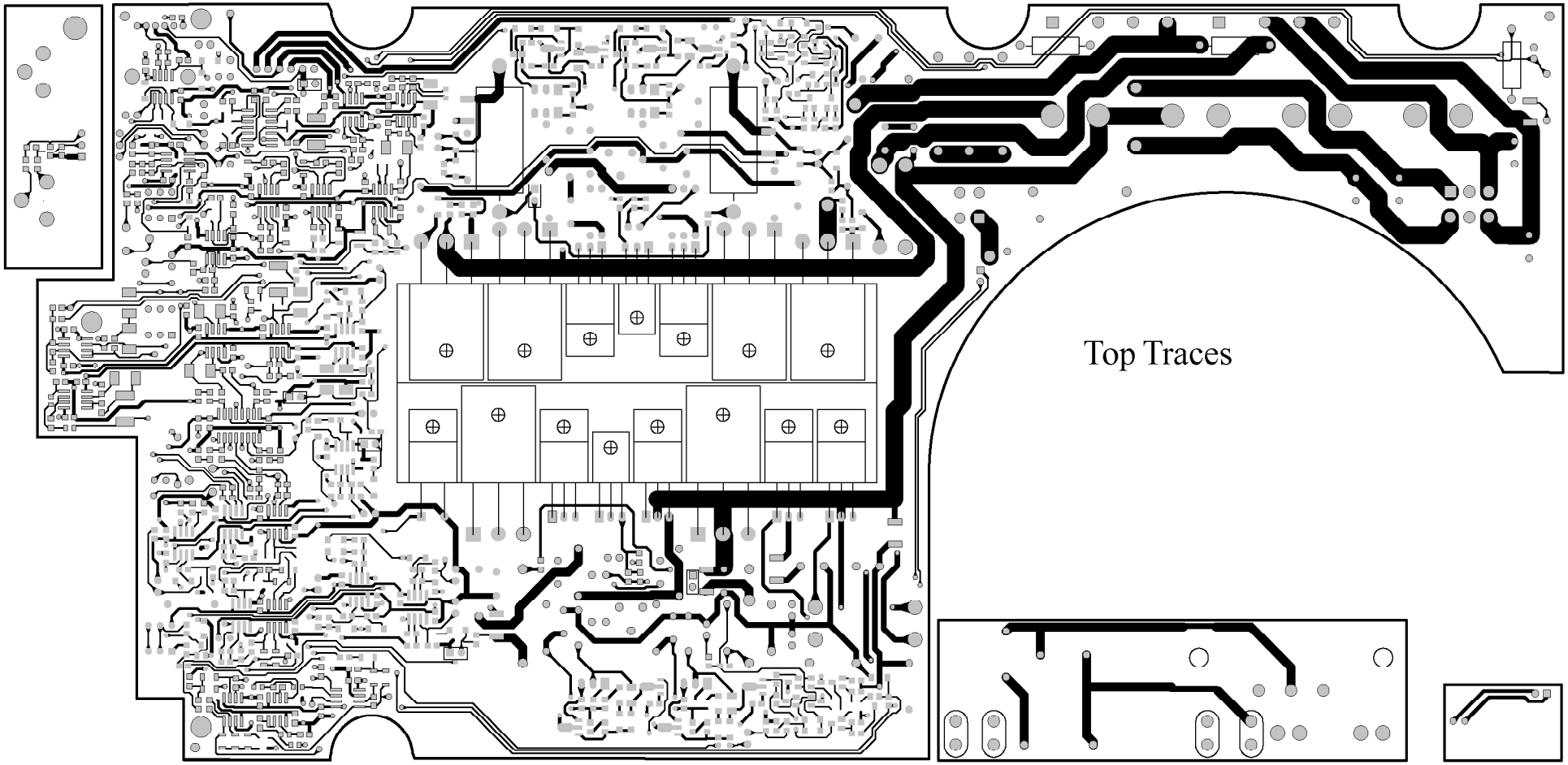

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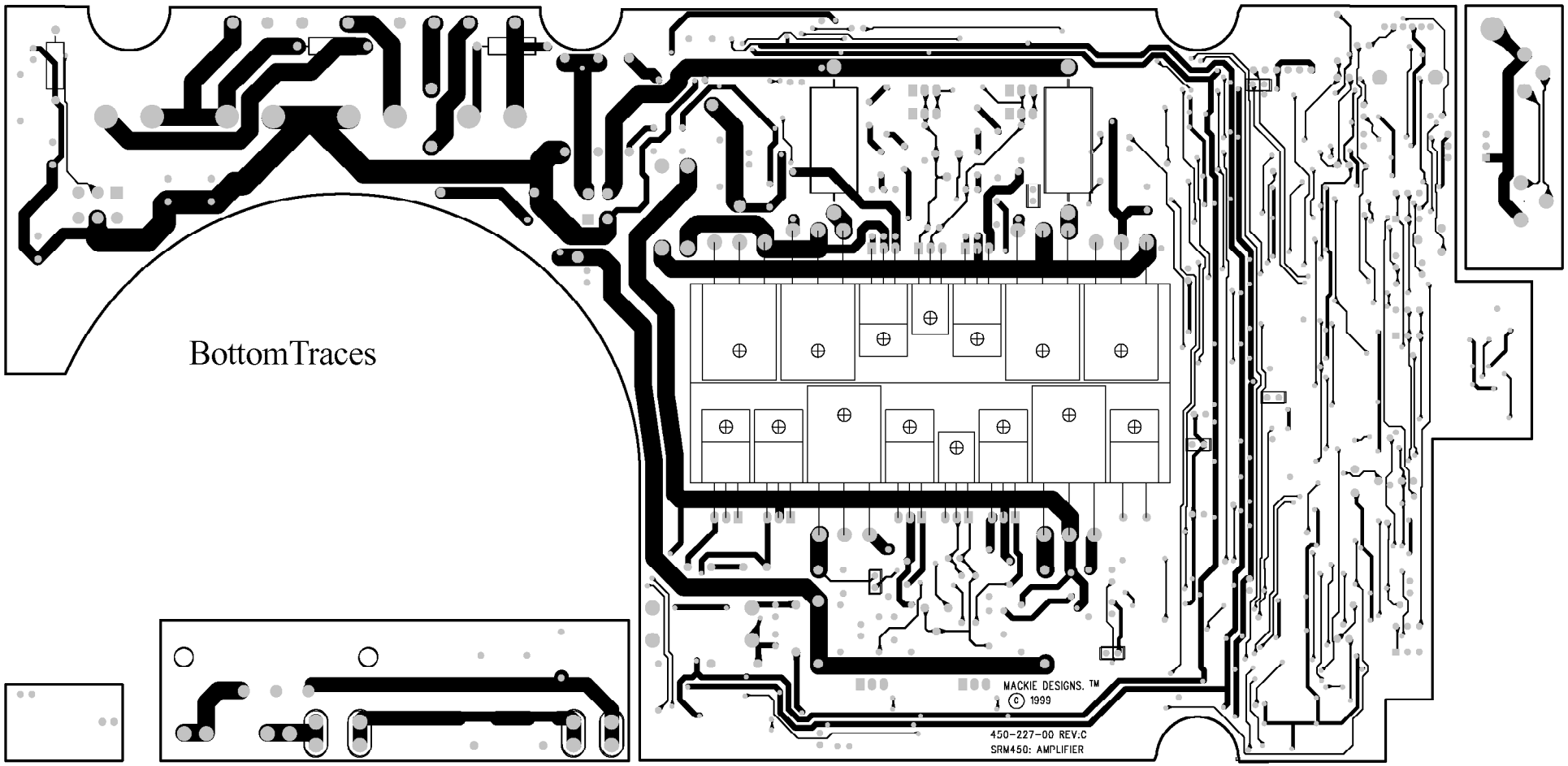

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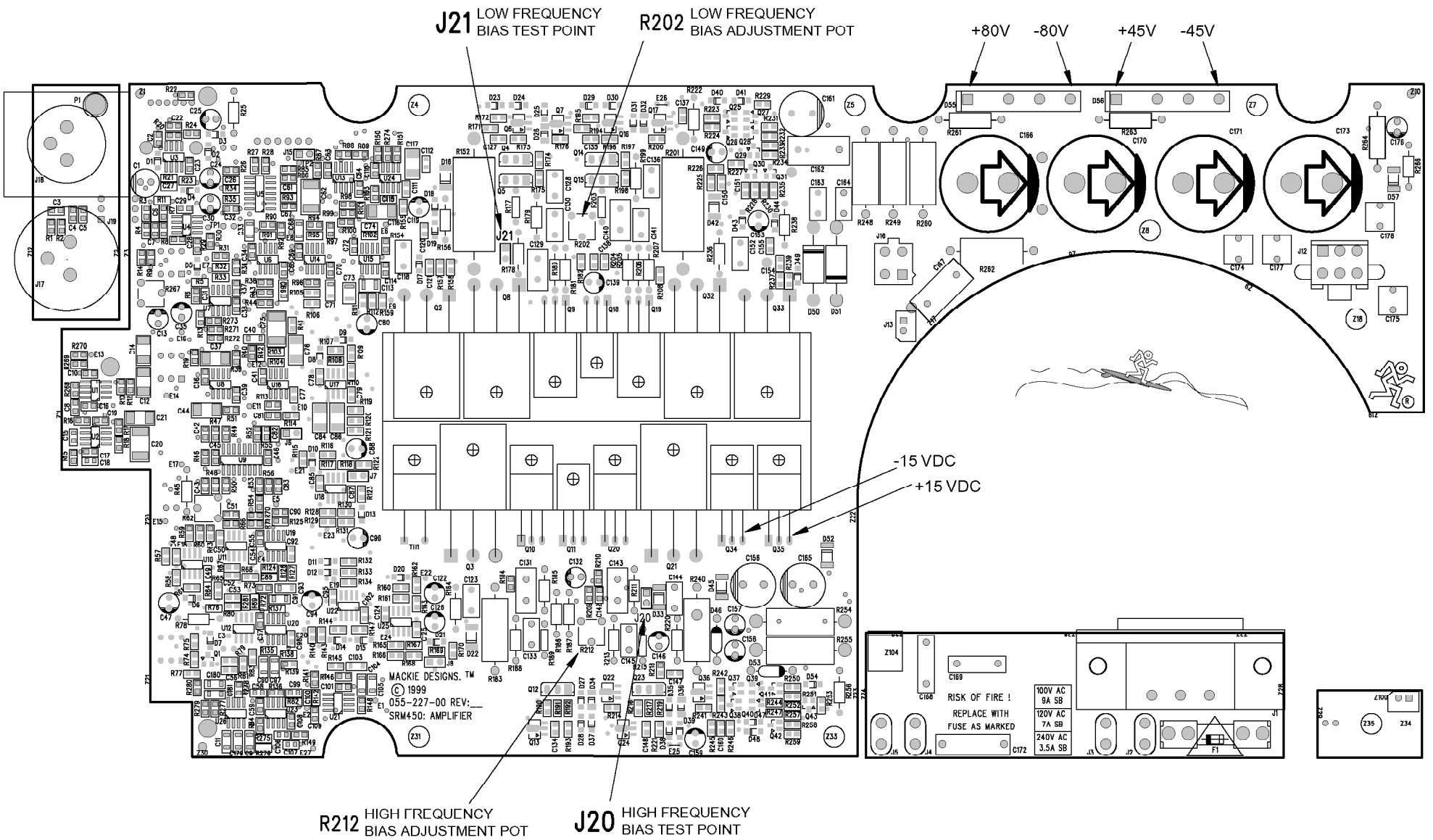

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